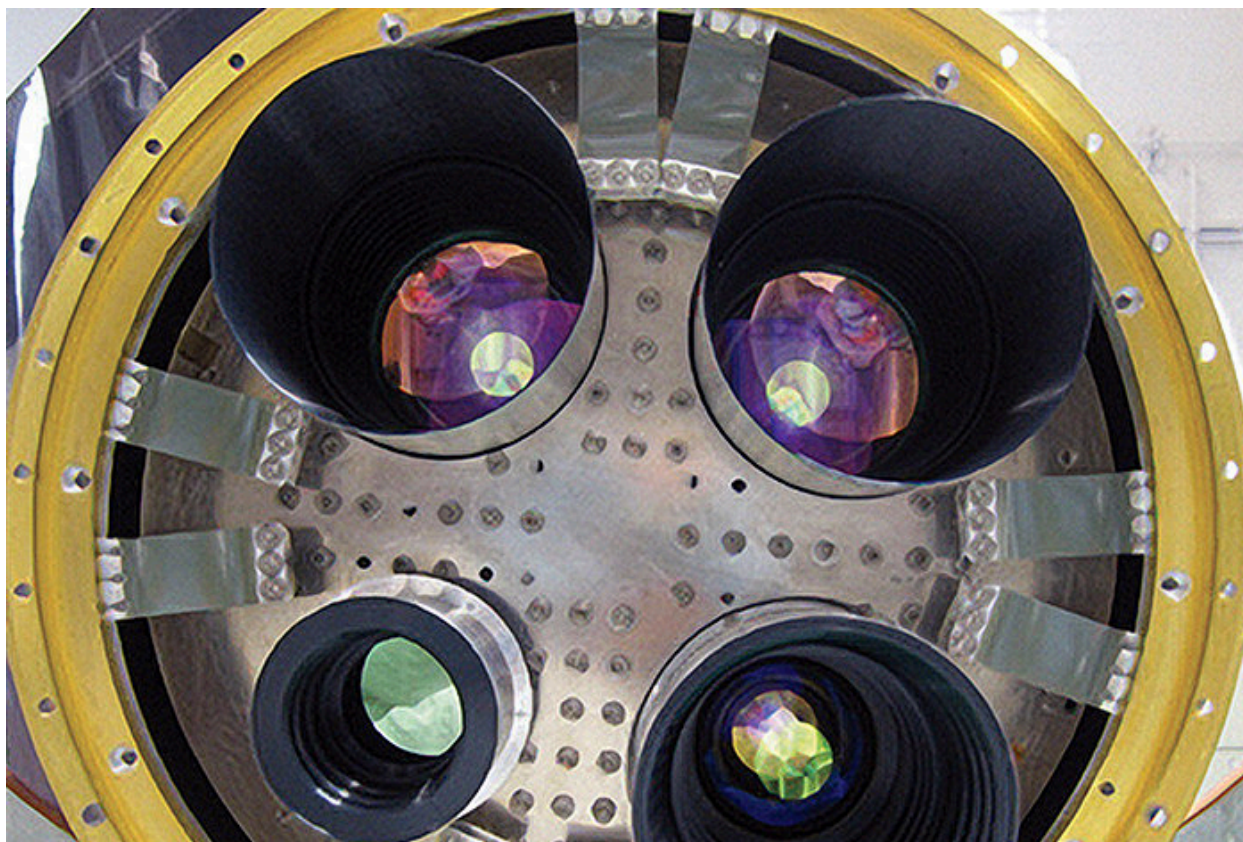


Unusual light in dark space revealed by Los Alamos, NASA

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Near-infrared data could change the way we think about galaxies

LOS ALAMOS, N.M., Nov. 7, 2014—By looking at the dark spaces between visible galaxies and stars the NASA/JPL CIBER sounding rocket experiment has produced data that could redefine what constitutes a galaxy.

"What was very surprising is the brightness of many fluctuations that appear between stars and galaxies," said Los Alamos scientist Joseph Smidt, part of the data analysis team that studied the data from CIBER. "These fluctuations are having us rethink what goes on between stars and galaxies. The data suggests that galaxies shed many more of their stars into the intervening space than was originally thought."

Results from two of four CIBER flights, launched from White Sands Missile Range in New Mexico in 2010 and 2012, appear in today's issue of the journal *Science*.

1:13

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In a video available on the [Los Alamos YouTube channel](#), Smidt describes how a galaxy's stars mix and merge based on the CIBER data.

CIBER, the Cosmic Infrared Background Experiment, is designed to understand the physics going on between visible stars and galaxies. The relatively small, sub-orbital rocket unloads a camera that snaps pictures of the night sky in near-infrared wavelengths, between 1.2 and 1.6 millionth of a meter. In their analysis Michael Zemcov, an astronomer at Cal Tech and the Jet Propulsion Laboratory, and Smidt take the data and remove all the known visible stars and galaxies and quantify what is left.

"We think stars are being scattered out into space during galaxy collisions," said Zemcov, lead author of the new paper describing the results from the rocket project.

"While we have previously observed cases where stars are flung from galaxies in a tidal stream, our new measurement implies this process is widespread."

The surprising findings could redefine what people commonly think of as galaxies. The research indicates that some of the stars in a galaxy may not be constrained by certain boundaries, but instead could stretch out far into space, more like an ocean of stars rather than the relatively tight groupings we think of as galaxies.

Smidt works in the Laboratory's X-Theoretical Design division and specializes in theoretical modeling and analyzing the data sets of complex systems. "It's very exciting to be part of a physics experiment that leads to such an interesting conclusion that changes our understanding of how galaxies interact," he said. "Los Alamos has a long history in astrophysics, trying to better understand the universe and its origins, so to be part of this research is very gratifying."

Photo caption for image below: The CIBER sounding rocket is launched from White Sands Missile Range. NASA image.

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